

WHAT IS CLAIMED IS:

1. A negative planographic printing plate comprising a substrate carrying thereon a recording layer wherein: the recording layer contains a polymerizable compound and an infrared absorbing agent, and a polymerization reaction caused by the action of light or heat decreases solubility of the recording layer in an alkali developer; the optical density of said recording layer is in a range from 0.4 to 2.0; and the film hardness of the upper portion of said recording layer after solubility in an alkali developer is reduced due to the action of light or heat is higher than the average film hardness of the whole recording layer.

2. A negative planographic printing plate according to claim 1, wherein said recording layer contains an infrared absorbing agent under conditions where ablation does not occur.

3. A negative planographic printing plate according to claim 1, wherein said recording layer contains (A) an infrared absorbing agent, (B) a radical generator and (C) a radical-polymerizable compound which causes a polymerization reaction with the generated ., said polymerization reaction causing hardening.

4. A negative planographic printing plate according to claim 3, wherein said recording layer further contains (D) a binder polymer.

5. A negative planographic printing plate according to claim 1, wherein the optical density of said recording layer is in

a range from 0.6 to 1.6.

6. A negative planographic printing plate according to claim 1, wherein the ratio of the film hardness of the upper part of said recording layer to the average film hardness [value of (upper part film hardness/average film hardness)] is 1.2 or more.

7. A negative planographic printing plate according to claim 3, wherein said infrared absorbing agent (A) is selected from the group consisting of cyanine colorants, squarylium colorants, pyrylium salts, and nickel thiolate complexes.

8. A negative planographic printing plate according to claim 3, wherein said radical generator (B) is an onium salt.

9. A method of producing a negative planographic printing plate which comprises a step of exposing a planographic printing plate containing a substrate carrying thereon a recording layer which contains a polymerizable compound and an infrared absorbing agent, and in which a polymerization reaction caused by the action of light or heat decreases solubility of the recording layer in an alkali developer, the optical density of said recording layer is in a range from 0.4 to 2.0, and the film hardness of the upper part of said recording layer after reduction in solubility in an alkali developer due to the action of light or heat is higher than the average film hardness of the recording layer, and a step of developing the plate with a developer, the developer being less capable of permeating through the recording layer after said recording layer is hardened by exposure.

10. A method of producing a negative planographic printing plate according to claim 9, wherein said recording layer contains an infrared absorbing agent under conditions where ablation does not occur.

11. A method of producing a negative planographic printing plate according to claim 9, wherein said recording layer contains (A) an infrared absorbing agent, (B) a radical generator and (C) a radical-polymerizable compound which causes a polymerization reaction with the generated radical, said polymerization reaction causing hardening.

12. A method of producing a negative planographic printing plate according to claim 11, wherein said recording layer further contains (D) a binder polymer.

13. A method of producing a negative planographic printing plate according to claim 9, wherein the optical density of said recording layer is in a range from 0.6 to 1.6.

14. A method of producing a negative planographic printing plate according to claim 9, wherein the ratio of the film hardness of the upper part of said recording layer to the average film hardness [value of (upper part film hardness/average film hardness)] is 1.2 or more.

15. A method of producing a negative planographic printing plate according to claim 11, wherein said infrared absorbing agent (A) is selected from the group consisting of cyanine colorants, squarylium colorants, pyrylium salts, and nickel thiolate complexes.

16. A method of producing a negative planographic printing

plate according to claim 11, wherein said radical generator (B)
is an onium salt.

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